

IN THE CLAIMS:

Please amend the claims to read as follows:

1. (Currently amended) An apparatus for chlorine dioxide generation, the apparatus comprising:

a plurality of metering pumps;

a reaction column having multiple inlet ports, selected inlet ports of the multiple inlet ports each being operably connected to a respective metering pump of the plurality of metering pumps; and

a synchronizer controlling the plurality of metering pumps to provide synchronized delivery of a plurality of reactant chemicals to the reaction column synchronize the pulsations of each metering pump of the plurality of metering pumps.

2. (Currently amended) The apparatus of claim 1, the reaction column further configured to have having a plurality of tee-shaped internal passages.

3. (Currently amended) The apparatus of claim 2, wherein ~~the tee-shaped passages are configured to introduce a plurality of reactant chemicals capable of forming chlorine dioxide to each other~~ the reaction column comprises a first reaction site, a first internal passage of the plurality of internal passages connecting a first inlet port of the multiple inlet ports to the first reaction site, a second internal passage of the plurality of internal passages connecting a second inlet port of the multiple inlet ports to the first reaction site.

4. (Currently amended) The apparatus of claim 3, ~~the tee-shaped passages further configured to promote mixing of the reactant chemicals~~ further comprising a first reactant chemical flowing within the first internal passage and a second reactant chemical flowing within the second internal passage, the first and second internal passages shaped to promote mixing of the first and second reactant chemicals at the first reaction site.

5. (Currently amended) The apparatus of claim 4, wherein the ~~tee-shaped~~ first and second internal passages promote mixing of the first and second reactant chemicals by providing at least one head on collision of the first and second reactant chemicals at the first reaction site.

6. (Currently amended) The apparatus of claim 5, wherein the ~~tee-shaped~~ first and second internal passages further promote mixing of the first and second reactant chemicals by generating turbulent flow in reactant chemicals by providing abrupt changes in the flow path.

7. (Currently amended) The apparatus of claim 6, wherein ~~the reactant chemicals react in a first and a second reaction~~ the reaction column comprises a second reaction site, a third internal passage of the plurality of internal passages connecting a third inlet port of the multiple inlet ports to the second reaction site, and a fourth internal passage of the plurality of internal passages connecting the first reaction site to the second reaction site.

8. (Currently amended) The apparatus of claim 7, wherein the first reaction involves the reaction of two of the reactant chemicals to form chlorine gas reactant chemical and the second reactant chemical react at the first reaction site to form a first product.

9. (Currently amended) The apparatus of claim 8, wherein the second reaction involves the reaction between the chlorine gas and an additional reactant chemical to form chlorine dioxide further comprising a third reactant chemical flowing within the third internal passage and wherein the third reactant chemical and the first product react at the second reaction site to form a second product.

10. (Currently amended) The apparatus of claim 9, wherein the first and second reactions occur under a vacuum created by a carrier fluid flowing through an eductor further comprising an eductor with a carrier fluid passing therethrough, wherein the eductor is connected to the reaction column to generate a vacuum at the first and second reaction sites.

11. (Original) The apparatus of claim 10, wherein the carrier fluid comprises water.

12. (Currently amended) The apparatus of claim 1, wherein the synchronized delivery further synchronizer comprises a repeat cycle timer to ensure that all the metering pumps pulsations are synchronized to occur at the same time.

13-30. (Cancelled)

31. (Currently amended) An apparatus for generating a selected chemical compound from multiple reactants, the apparatus comprising:

multiple reactants:

a plurality of metering pumps, each metering pump of the plurality of metering pumps being operably connected to deliver a reactant of the multiple reactants to a reaction column;

the reaction column comprising multiple inlet ports to receive the multiple reactants and a first reaction site where selected reactants of the multiple reactants are introduced to one another; and

a synchronizer operably connected to the plurality of metering pumps to control the pulsations of the plurality of metering pumps to provide a synchronized delivery of selected reactants of the multiple reactants to the reaction column.

32. (Previously presented) The apparatus of claim 31, the reaction column further comprising:

a first conduit conducting a first reactant of the multiple reactants from a first inlet port of the multiple inlet ports to the first reaction site; and

a second conduit conducting a second reactant of the multiple reactants from a second inlet port of the multiple inlet ports to the first reaction site.

33. (Previously presented) The apparatus of claim 32, the reaction column further comprising:

a second reaction site;

a third conduit conducting a third reactant of the multiple reactants from a third inlet port of the multiple inlet ports to the second reaction site; and

a fourth conduit conducting a mixture of the first and second reactants from the first reaction site to the second reaction site.

34. (Previously presented) The apparatus as defined in claim 33, wherein the first, second, and third conduits are further configured to promote mixing of the multiple reactants.

35. (Previously presented) The apparatus as defined in claim 34, wherein the first and second conduits promote mixing by providing a substantially head-on collision of the first and second reactants at the first reaction site.

36. (Previously presented) The apparatus as defined in claim 35, wherein the first and second conduits promote mixing by generating turbulent flow in the first and second reactants through the use of abrupt, substantially right angle changes in the direction of flow.

37. (Currently amended) The apparatus as defined in claim 36, wherein selected reactants of the multiple reactant reactants react in a first reaction at the first reaction site and a second reaction at the second reaction site.

38. (Currently amended) The apparatus as defined in claim 37, wherein the first reaction ~~combines the first and second reactants to form chlorine gas and second reactants react at the first~~ reaction site to form chlorine gas.

39. (Currently amended) The apparatus as defined in claim 38, ~~wherein the second reaction combines the chlorine gas and the third reactant to form chlorine dioxide wherein the~~ chlorine gas and the third reactant react at the second reaction site to form chlorine dioxide.

40. (Currently amended) The apparatus as defined in claim 39, ~~wherein the first and second reactions occur under a vacuum created by a carrier fluid flowing through an eductor further~~ comprising an eductor with a carrier fluid passing therethrough, the eductor connected to the reaction column to generate a vacuum at the first and second reaction sites.

41. (Previously presented) The apparatus as defined in claim 40, wherein the carrier fluid comprises water.

42. (Previously presented) The apparatus as defined in claim 31, wherein the synchronizer comprises a repeat cycle timer.

43. (Previously presented) An apparatus for selectively combining multiple reactants to generate a selected chemical compound, the apparatus comprising:

a reaction column having multiple inlet ports, internal conduits, a first reaction site, and a second reaction site;

a first conduit of the internal conduits conducting a first reactant of the multiple reactants from a first inlet port of the multiple inlet ports to the first reaction site;

a second conduit of the internal conduits conducting a second reactant of the multiple reactants from a second inlet port of the multiple inlet ports to the first reaction site;

a third conduit of the internal conduits conducting a third reactant of the multiple reactants from a third inlet port of the multiple inlet ports to the second reaction site;

a fourth conduit of the internal conduits conducting a mixture of the first and second reactants from the first reaction site to the second reaction site; and

the length of the fourth conduit corresponding to the volumetric flow rate of the mixture of the first and second reactants to provide sufficient time for the first and second reactants to substantially completely react before entering the second reaction site.

44. (Previously presented) The apparatus as defined in claim 43, wherein the first and second conduits promote mixing of the first and second reactants by providing a substantially head-on collision of the first and second reactants at the first reaction site.

45. (Previously presented) The apparatus as defined in claim 44, wherein the first and second conduits further promote mixing of the first and second reactants by generating turbulent flow through the use of abrupt, substantially right angle changes in the direction of flow.